

interchange to closely monitor the sales of the items that they produce and to respond quickly to diminishing inventories. They are, therefore, able to keep retailers stocked with the most popular items and to reduce production of apparel that is not selling well. Because of fierce competition in the market for apparel and the growing demands of large retailers, however, apparel firms will continue to be under intense pressure to cut costs and produce more with fewer workers.

Despite advances in technology, it has been difficult to use automated equipment extensively in the apparel industry due to the soft properties of textile products. In addition, it is time consuming and expensive to adapt existing technology to the wide variety of items produced and the frequent style and seasonal changes. However, some larger firms and those that produce standardized items have automated pre-sewing functions, material handling, and some simple sewing procedures. Technological developments, such as computer-aided marking and grading, computer-controlled cutters, semiautomatic sewing and pressing machines, and automated material handling systems have increased output while reducing the need for some workers in larger firms. As the apparel industry continues to restructure and consolidate, more of the smaller, less efficient producers will lose market share to larger firms and foreign producers.

Another practice that will influence employment levels is the use of offshore assembly. A provision in U.S. tariff regulations reduces tariffs on apparel imports from Caribbean nations that are assembled from pieces of fabric which were cut in the United States. This enables the most labor-intensive step in the production process—assembly—to be performed at much lower wage rates. This trend is expected to continue and will curtail job opportunities for sewing machine operators in the United States. Because many pre-sewing functions such as design will continue to be done domestically, however, workers who perform these functions will not be as adversely affected.

Custom tailors and sewers, the most skilled apparel workers, are also expected to experience declining employment. Demand for their services will continue to lessen as consumers are increasingly likely to buy new, mass-produced apparel instead of purchasing custom-made apparel or having clothes altered or repaired.

### Earnings

Earnings of apparel workers vary by industry and occupation. Median hourly earnings of the largest group of apparel workers—garment sewing machine operators—were \$7.09 in 1998. Most of these workers earned between \$5.99 and \$8.43. Median hourly earnings in the industries that employed the most garment sewing machine operators in 1997 were:

Knitting mills .....	\$7.32
Miscellaneous fabricated textile products .....	7.22
Men's and boys' furnishings .....	6.99
Women's and children's undergarments .....	6.34
Women's and misses' outerwear .....	6.07

Sewing machine operators who assembled nongarment items had slightly higher earnings in 1998. Median hourly earnings were \$8.17, with most of these workers earning between \$6.67 and \$9.84. Earnings in the industries that employed the largest number of nongarment sewing machine operators in 1997 were:

Household furniture .....	\$8.99
Miscellaneous fabricated textile products .....	7.86

Earnings also varied among other apparel workers. Pressing machine operators had median hourly earnings of \$7.28 in 1998, while patternmakers and layout workers earned about \$10.38. Among hand workers, cutters and trimmers earned \$8.23, pressers earned \$7.09, and sewers earned \$7.46 an hour. Finally, custom tailors earned a median annual income of \$18,630 in 1998. Because many production workers in apparel manufacturing are paid according to the number of acceptable pieces they or their group produce, their total earnings depend on skill, speed, and accuracy.

Benefits also vary. A few large employers, for example, include child care in their benefits package. Apparel workers in retail trade also may receive a discount on their purchases. In addition, some of the larger manufacturers operate company stores, where employees can purchase apparel products at significant discounts. Some small firms, however, offer only limited benefits. In addition to employer-sponsored benefits, the principal union—the Union of Needletrades, Industrial, and Textile Employees (UNITE)—provides benefits to its members.

### Related Occupations

The duties of apparel workers vary from those requiring very little skill and training to those that are highly complex, requiring several years of training. Workers operating machinery and equipment, such as pressing or sewing machine operators, perform duties similar to metalworking and plastics-working, textile, and shoe sewing machine operators. Other workers who perform handwork are precision woodworkers, precision assemblers, upholsterers, and shoe and leather workers.

### Sources of Additional Information

Information regarding careers in apparel is available from numerous technical institutes that offer specialized textile and apparel programs. A list of these can be found in college guides. In addition, the local office of the State employment service or an apparel manufacturer can provide information on job opportunities in a specific area.

For general information on the apparel industry, contact:

☛ American Apparel Manufacturers Association, 2500 Wilson Blvd., Suite 301, Arlington, VA 22201.

Internet: <http://www.americanapparel.com>

## Shoe and Leather Workers and Repairers

(O\*Net 89511)

### Significant Points

- Workers generally learn their craft on the job; trainees become fully skilled in 6 months to 2 years.
- Employment is expected to decline, reflecting increases in imports, laborsaving machinery, and business costs.

### Nature of the Work

Shoe and leather workers create stylish and durable leather products, such as boots, saddles, and luggage. Although they produce different goods, shoe and leather workers share many tasks. For example, they first check the texture, color, and strength of the leather. They then place a pattern of the item being produced on the leather, trace the pattern onto the leather, cut along the outline, and sew the pieces together. Other steps may vary according to the type of good being produced.

*Orthopedic and therapeutic shoemakers*, for instance, make or modify footwear according to a doctor's prescription. These workers attach the insoles to shoe lasts (a wooden form shaped like a foot), affix the shoe uppers, and apply heels and outsoles. These shoemakers then shape the heels with a knife and sand them on a buffing wheel for smoothness. Finally, they dye and polish the shoes. Custom shoe workers also may modify existing footwear for people with foot problems and special needs. This can involve preparing inserts, heel pads, and lifts from casts of customers' feet.

In addition to the common steps listed above, *saddlemakers* often apply leather dyes and liquid top coats to produce a gloss finish on a saddle. They may also decorate the saddle surface by hand stitching or by stamping the leather with decorative patterns and designs. *Luggage makers* fasten leather to a frame and attach handles and other hardware. They also cut and secure linings inside the frames and sew or stamp designs onto the luggage exterior.

*Shoe and leather repairers* use their knowledge of leatherworking to extend the lives of worn leather goods. The most common type of shoe repair is replacing soles and heels. Repairers place the shoe on a last and remove the old sole and heel with a knife or pliers or both. They then attach new soles and heels to shoes either by stitching them in place or by using cement or nails. Leather repairers also work with other leather goods, such as suitcases or handbags, that may need seams to be re-sewn or handles and linings replaced.

All leather workers and repairers use handtools and machines. The most commonly used handtools are knives, hammers, awls (used to poke holes in leather to make sewing possible), and skivers (for splitting leather). Power-operated equipment includes sewing machines, heel nailing machines, sanding machines, hole punching machines, sole stitchers, and computerized machinery to analyze foot needs and conditions.

Depending on the size of the factory or shop, a leather worker may perform one or more of the steps required to complete or repair a product. In smaller factories or shops, workers generally perform several tasks, while those in larger facilities tend to specialize. Most leather workers, however, eventually learn the different skills involved in producing leather goods as they move from one task to another.

Self-employed shoe repairers and owners of custom-made shoe and leather shops have managerial responsibilities in addition to their regular duties. They must maintain good relations with their customers, make business decisions, and keep accurate records.

### Working Conditions

Working conditions of leather workers vary according to the type of work performed, the size of the factory or business, and the practices of each shop. Workers employed in custom leather goods manufacturing establishments generally work a regular 40-hour week. Those in repair shops work nights and weekends and often work irregular hours. For those who own repair shops, long hours are common.

Shoe and leather workers and repairers need to pay close attention when working with machines to avoid punctures, lacerations, and abrasions. Although there are few health hazards if precautions are followed, work areas can be noisy and odors from leather dyes and stains are often present.

### Employment

Shoe and leather workers and repairers held about 23,000 jobs in 1998. Wage and salary workers held about 17,000 jobs. About half of these wage and salary workers were employed in the manufacture of footwear products; one-fifth were employed in the production of leather goods such as luggage, handbags, and apparel; and another fifth worked in shoe repair and shoeshine shops. Self-employed individuals, who typically own and operate small shoe repair shops or specialty leather manufacturing firms, held about 6,000 jobs.



*Shoe and leather workers typically learn their skills on the job.*

### Training, Other Qualifications, and Advancement

Precision shoe and leather workers and repairers generally learn their craft on the job, either through in-house training programs or working as helpers to experienced workers. Helpers usually begin by performing simple tasks and progressing to more difficult jobs like cutting or stitching leather. Trainees typically become fully skilled in 6 months to 2 years; the length of training varies according to the nature of the work and the aptitude and dedication of the individual.

A limited number of schools and national shoe repair chains offer training in shoe repair and leather work. These programs may last from a few weeks to 1 year and impart basic skills including leather cutting, stitching, and dyeing. Students learn shoe construction, practice shoe repair, and study the fundamentals of running a small business. Graduates are encouraged to gain additional training by working with an experienced leather worker or repairer.

Shoe repairers need to keep their skills up-to-date to work with rapidly changing footwear styles. Some repairers do this by attending trade shows and receiving training from product manufacturers. Others attend specialized training seminars and workshops in custom shoe making, shoe repair, and other leather work sponsored by national and regional associations.

*Pedorthists*—who produce or modify prescription footwear—may receive certification from the Pedorthic Footwear Association. These workers become certified after completing 120 hours of training and passing an exam.

Manual dexterity and the mechanical aptitude to work with handtools and machines are important in the shoe repair and leatherworking occupations. Shoe and leather workers who produce custom goods should have artistic ability as well. These workers should have self-discipline to work alone under little supervision. In addition, leather workers and repairers who own shops must have knowledge of business practices and management, as well as a pleasant manner when dealing with customers.

Many individuals begin as workers or repairers and advance to salaried supervisory and managerial positions. Some may open their own shop or business.

### Job Outlook

Employment of shoe and leather workers is expected to decline through 2008, primarily because of the growing number of imported shoes and other leather goods which have displaced domestic production. In addition, inexpensive imports have made the cost of replacing shoes and leather goods cheaper or more convenient than repairing them, thereby reducing the demand for shoe and leather repairers.

These workers are also adversely affected by other factors, such as the rising cost of leather and higher rents in the high-traffic areas in which more shoe repairers are relocating. Moreover, shoe repair shops that offer “while-you-wait” service are investing in new machinery which is making repairers more productive and helping to reduce the demand for these workers. Some of the more expensive, fine leather products will continue to be repaired, however, and this demand will moderate the employment decline of shoe and leather repairers. In the future, though, most job openings in this occupation will arise from the need to replace experienced workers who transfer to other occupations or leave the work force.

Prospects for workers employed in the manufacture and modification of custom-made molded or orthopedic shoes are better than those for most other leather workers. This reflects rapid growth in the elderly population and an increasing emphasis on preventive foot care. The employment effects of these trends may be limited, however, because the demand for orthopedic footwear is increasingly filled by manufactured shoes that are modified to specification instead of completely custom made.

### Earnings

Median hourly earnings of shoe and leather workers and repairers were \$7.99 in 1998. Half earned between \$6.50 and \$9.84. The bottom 10 percent earned less than \$5.79, while the top 10 percent earned over \$11.47. Those employed in the non-rubber footwear industry earned

an average of \$7.73 an hour in 1997. Owners of shoe repair and custom shoe manufacturing shops typically earn substantially more than beginning salaried workers.

### Related Occupations

Other workers who make or repair items using handtools and machinery include dressmakers, custom tailors and sewers, designers and patternmakers, and furriers.

### Sources of Additional Information

For information about the custom-made prescription shoe business and training opportunities in this field, contact:

☛ Pedorthic Footwear Association, 7150 Columbia Gateway Dr., Suite G, Columbia, MD 21046. Internet: [www.pedorthics.org](http://www.pedorthics.org)

## Textile Machinery Operators

(O\*Net 92702, 92705, 92708, 92711, and 92714)

### Significant Points

- Employment is expected to decline, primarily due to more productive machinery and open international trade.
- Because the textile industry is highly automated, persons with technical skills and some computer training will have the best opportunities.
- Night and weekend shifts are common, because many textile and fiber mills operate 24 hours a day.
- Earnings are low.

### Nature of the Work

Textile machinery operators tend machines that manufacture a wide range of textile products. Most people know that textiles are used to make hosiery, towels, and socks; but many are surprised to learn that textile products are used in such things as roofs, tires, and roads. Textile machinery operators play an important part in producing all these goods, by controlling equipment that cleans, cards, combs, and draws fiber; spins fiber into yarn; and weaves, knits, or tufts yarn into textile products. These workers are responsible for numerous machines that they start, stop, clean, and monitor for proper functioning.

There are many phases in the textile production process, and operators' duties depend on the product and type of machinery used. The process begins with the preparation of synthetic or natural fibers for spinning. Fibers are cleaned and aligned through processes called carding and combing. To prepare the fiber for spinning, very short fibers and foreign matter are removed, and the fibers are drawn into a substance called sliver. During this process, different types of fibers may be combined, to give products a desired texture, durability, or other characteristics. Operators constantly monitor their machines during this stage, checking the movement of the fiber, removing and replacing cans of sliver, repairing breaks in the sliver, and making minor repairs to the machinery. The full cans of sliver are then taken to the spinning area, where they are drawn and twisted onto bobbins to produce yarn. (This is an automated version of the old fashion spinning wheel.)

In contrast to the process described above, some workers oversee machinery that makes fibers from wood pulp or chemicals. To produce this fiber, wood pulp or chemical compounds are melted or dissolved in a liquid, which is then extruded, or forced, through holes in a metal plate, called a spinneret. The sizes and shapes of the holes in the spinneret determine the shape and uses of the fiber. Workers adjust the flow of fiber base through the spinneret, repair breaks in the fiber, and make minor adjustments to the machinery. Because this fiber is created

through a chemical process, chemical companies, not textile mills, employ the majority of these workers.

Whether natural or manufactured, finished yarn is then taken to be woven, knitted, tufted, or bonded with heat or chemicals. Each of these processes creates a different type of textile product and requires a different type of machine. Woven fabrics are made on looms that interlace the yarn. Knit products, such as socks or women's hosiery, are produced by intermeshing loops of yarn. Carpeting is made through the tufting process, in which the loops of yarn are pushed through a backing material. Although the processes are now highly automated, these concepts have been used for many centuries to produce textile products.

Once the yarn has been woven, knitted, or tufted, the resulting fabric is ready to be dyed and finished—either at the textile mill or at a plant specializing in textile finishing. Depending on the end use of the yarn, it may be dyed before or after it is woven, knitted, or tufted. Some fabric is treated before it is dyed, to remove other chemical additives that could affect the quality of the finished product. Products are often finished by treating them to prevent excessive shrinkage, provide strength, make them stain-resistant, or give them a silky luster. In the production of hosiery and socks, for example, the stocking or sock is placed on a form and then exposed to steam and heat to give it shape.

Textile machinery operators play a vital role in all of the various processes described above. In spite of this wide range of processes, operators share many responsibilities. Most prepare their machinery prior to a production run and help maintain the equipment, by adjusting the timing on a machine, threading the harnesses that create patterns in textile goods, and repairing machinery. Each operator oversees numerous machines, performing such duties as repairing breaks in the yarn and monitoring its supply. Because highly automated machinery is used in textile mills, computers control many of the processes, making it possible for each operator to monitor a large area or number of machines. The complexity of many machines often requires operators to specialize in a particular type of machine.

### Working Conditions

Most textile machine operators work in textile mills or chemical plants. Working conditions in these facilities depend on the age and degree of modernization of the factory. New facilities usually offer ventilation and climate control that reduce potential problems caused by airborne fibers and fumes. In a few old facilities, workers in areas with high levels of airborne materials often use protective glasses and masks that cover their noses and mouths.

Although some new machinery is relatively quiet, a number of workers still wear ear protection. Many machines operate at high speeds, and workers must be careful not to wear clothing or jewelry that could get caught in moving parts. In addition, many extruding and



*Textile production is highly automated.*